In the claims:

1. (Currently Amended) An imaging tube assembly comprising:

a casing;

an insert contained within said casing, within a coolant bath, and having a vacuum chamber;

an anode residing within said vacuum chamber and rotating on a shaft via at least one bearing; and

at least one seal residing between said insert and said shaft, said at least one seal preventing passage of ~~at least one gas~~said coolant bath into said vacuum chamber.

2. (Original) An assembly as in claim 1 further comprising at least one pressure transition chamber coupled to said insert and said shaft, said at least one pressure transition chamber having a middle pressure between an internal fluid pressure of said vacuum chamber and an external fluid pressure of said insert.

3. (Original) An assembly as in claim 1 wherein said anode is in a cantilever configuration with said shaft relative to said insert.

4. (Original) An assembly as in claim 3 wherein said shaft comprises an end residing within said insert, said anode is coupled to and rotating via said end.

5. (Original) An assembly as in claim 3 wherein said insert comprises at least one side structure that protrudes within said vacuum chamber, said anode rotating at an inner end of said at least one side structure.

6. (Original) An assembly as in claim 3 wherein at least one side of said insert is inner cooled via a cooling fluid circulating thereabout.

7. (Original) An assembly as in claim 6 wherein said insert is inner cooled via said cooling fluid circulating therein.

8. (Original) An assembly as in claim 1 wherein said anode is inner cooled via a cooling fluid circulating therein.

9. (Original) An assembly as in claim 1 wherein said seal is at least partially surrounded by a structural member of said insert and resides between said anode and said at least one bearing.

10. (Original) An assembly as in claim 1 wherein said anode and said shaft are in a straddle configuration relative to said insert.

11. (Original) An assembly as in claim 10 wherein said at least one bearing comprises:

a first bearing on a first external side of said insert; and

a second bearing on a second external side of said insert.

12. (Original) An assembly as in claim 1 wherein said at least one seal is a ferro-fluidic rotating vacuum seal.

13. (Original) An assembly as in claim 1 wherein said anode comprises a coolant channel for direct and internal cooling of said rotating anode.

14. (Original) An assembly as in claim 1 wherein said anode rotates relative to said insert.

15. (Original) An assembly as in claim 1 further comprising:

a cathode residing within said vacuum chamber; and

a cathode-suspending member coupled to said cathode and positioning said cathode in close proximity of a target of said anode.

16. (Original) An assembly as in claim 1 further comprising a pump coupled to and removing fluid from said vacuum chamber in response to a vacuum pressure signal.

17. (Currently Amended) An imaging tube assembly comprising:

a casing;

an insert contained within said casing, within a coolant bath, and having a vacuum chamber;

an anode residing within said vacuum chamber and rotating on a shaft via at least one bearing; and

at least one pressure transition chamber coupled to said insert and said shaft, said at least one pressure transition chamber having an associated middle fluid pressure that is between an internal fluid pressure of said vacuum chamber and an external fluid pressure of said coolant bath~~insert~~.

18. (Original) An assembly as in claim 17 wherein said anode is in a cantilever configuration on said shaft relative to said insert.

19. (Original) An assembly as in claim 17 wherein said anode and said shaft are in a straddle configuration relative to said insert.

20. (Currently Amended) An assembly as in claim 17 ~~further comprising a casing surrounding at least a portion of said insert;~~wherein said pressure transition chamber ~~residing~~resides between said insert and said casing.

21. (Original) An assembly as in claim 20 wherein said external fluid pressure is a vacuum pressure of an outer fluid external to said casing.

22. (Original) An assembly as in claim 17 further comprising at least one seal residing between said insert and said shaft and preventing passage of at least one gas into said vacuum chamber.

23. (Original) An assembly as in claim 22 wherein a seal of said at least one seal is coupled directly to said insert, said shaft, and said pressure transition chamber.

24. (Original) An assembly as in claim 17 wherein said at least one seal comprises:

a first seal residing between said insert and said shaft; and

a second seal residing between said pressure transition chamber and said shaft.

25. (Original) An assembly as in claim 17 wherein said pressure transition chamber resides in an orientation relative to said insert, said orientation selected from at least one of said pressure transition chamber

residing at least partially internal to said insert and said pressure transition chamber residing at least partially external to said insert.

26. (Original) An assembly as in claim 17 wherein said middle fluid pressure is greater than said internal fluid pressure and less than said external fluid pressure.

27. (Original) An assembly as in claim 17 further comprising:

a sensor detecting pressure within said pressure transition chamber and generating a vacuum pressure signal; and

a controller coupled to said sensor and adjusting pressure within said pressure transition chamber in response to said vacuum pressure signal.

28. (Original) An assembly as in claim 27 further comprising a pump coupled to said controller and removing fluid from said pressure transition chamber in response to said vacuum pressure signal.

29. (Original) An assembly as in claim 28 wherein said pump is continuously operated to maintain said middle pressure.

30. (Original) An assembly as in claim 28 wherein said pump is activated in response to said middle pressure.

31. (Original) An assembly as in claim 28 wherein said pump maintains said middle pressure approximately between 0 and 1 of atmospheric pressure.

32. (Original) An assembly as in claim 17 further comprising:

a cathode residing within said vacuum chamber; and

a cathode-suspending member coupled to said cathode and positioning said cathode in close proximity of a target of said anode.

33. (Original) An assembly as in claim 17 wherein at least one side of said insert is inner cooled via a cooling fluid circulating thereabout.

34. (Original) An assembly as in claim 33 wherein said insert is inner cooled via said cooling fluid circulating therein.

35. (Original) An assembly as in claim 17 wherein said anode is inner cooled via a cooling fluid circulating therein.

36. (Original) A method of operating an x-ray tube comprising:

rotating an anode within a stationary insert via at least one bearing external to said stationary insert;

rotating said anode via a shaft that is sealed with respect to said stationary insert via a rotating seal; and

preventing passage of a cooling fluid into a vacuum chamber of said stationary insert via said rotating seal.

37. (Original) A method as in claim 36 further comprising directly cooling said anode via said shaft.

38. (Original) A method as in claim 36 further comprising transitioning pressure differential between said vacuum chamber and an external pressure of an external fluid that is external to said insert via a pressure transition chamber.

39. (Original) A method as in claim 36 further comprising continuously adjusting pressure with said pressure transition chamber.

40. (Original) A method as in claim 36 further comprising activating a pump to adjust pressure within said pressure transition chamber in response to a middle fluid pressure of said pressure transition chamber.

41. (Original) A method of operating an x-ray tube comprising:

generating at least one pressure signal indicative of at least one vacuum pressure within at least one enclosure of the x-ray tube;

generating an x-ray tube vacuum quality signal in response to said at least one pressure signal; and

determining whether to perform a maintenance task in response to said x-ray tube vacuum quality signal.

42. (Original) A method as in claim 41 further comprising preparing for replacement of the x-ray tube.

43. (Original) A method as in claim 41 further comprising setting service contract pricing in response to said x-ray tube vacuum quality signal.